

Quality of Life After Laparoscopic Adjustable Gastric Banding Using the Baros and Moorehead-Ardelt Quality of Life Questionnaire II

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ABSTRACT

Objectives: The goal of weight reduction surgery is not only to decrease excess weight, but also to improve obesity related comorbidities and quality of life (QoL). Until now, few studies have utilized objective methods to evaluate all of these issues. Hereafter, using the newly developed Moorehead-Ardelt Quality of Life Questionnaire II (M-A QoLQ II) incorporated into the Bariatric Analysis and Reporting Outcome System (BAROS), we report our results for patients undergoing laparoscopic adjustable gastric banding (LAGB).

Methods: M-A QoLQ II questionnaires were sent to patients undergoing LAGB at a single institution. Nonresponders were contacted by a second mailing and telephone calls. The respondents' data were scored according to BAROS guidelines.

Results: Data from 67 patients with a mean follow-up of 27 months (22–35) were analyzed. Mean age was 43.8 years (range, 21 to 68) with a mean preoperative body mass index (BMI) of 49.8 kg/m² (range, 38.4 to 67.7). Mean postoperative BMI was 37.1 kg/m² (range, 23.0 to 53.4) for a mean excess weight loss (EWL) of 53.2% (range, -7.5% to 108.6%). According to the BAROS scoring system, 8 patients (12%) were classified as failures, 13 patients (19%) had fair, 24 (36%) had good, 13 (19%) had very good, and 9 (13%) had excellent results. There was considerable improvement in patient's comorbidities, and positive scores for self-esteem, and activity level.

Conclusions: The use of the M-A QoLQ II is an efficient method of assessing the success of bariatric surgery. Widespread use of the questionnaire would assist in standardizing reporting of results following bariatric surgery.

Our results suggest that LAGB may lead to excellent results with regards to resolution of comorbidities, improvement in QoL, and overall weight loss.

Key Words: Laparoscopic adjustable gastric banding, Quality of life, Bariatric Analysis and Reporting Outcome System, Moorehead-Ardelt Quality of Life Questionnaire II.

INTRODUCTION

Obesity is a chronic disease that has reached epidemic proportions globally, with at least 300 million obese adults worldwide.¹ Obesity is associated with and contributes to numerous physical and psychosocial disorders. Surgical intervention is believed to be the most durable method of weight loss among morbidly obese patients. Laparoscopic adjustable gastric banding (LAGB) is one of the more recent bariatric procedures that has emerged as a successful means for surgical management of obesity. Currently, no standardized methods exist for evaluating the efficacy of LAGB or other bariatric procedures. In early studies, the success or failure of LAGB was determined entirely based on the amount of postoperative weight loss. This method of evaluating the efficacy of the procedure using a single variable raises 2 problems. First, there is no clear definition of successful weight loss as evidenced by the large variability among studies as to what extent of total weight loss constitutes success. Early criteria range from >15% of initial weight loss to using a threshold of >50% loss of excess weight to define a successful operation.² Second, this approach does not take into consideration the overall impact of LAGB on the psychological and physical well being of patients regardless of the absolute weight loss.

Some of these issues were addressed in the 1991 National Institutes of Health (NIH) Consensus Development Conference Draft Statement, which determined that "better statistical reporting of surgical results is urgently needed for better assessment of outcomes." In addition, the NIH declared "quality of life considerations in patients undergoing surgical treatment of obesity must be addressed."³ It is clear then that the most accurate assessment of the

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success or failure of a bariatric procedure should include weight loss, improvements in medical conditions related to morbid obesity, and improvements in quality of life. The Bariatric Analysis and Reporting Outcome System (BAROS), introduced by Oria and Moorehead in 1997, fulfills the above requirements proposed by the NIH and provides a standard for comparing outcomes of different bariatric procedures, using a simple, objective, unbiased method in an evidence-based fashion.²

The BAROS consists of a scoring system that includes 3 main areas of analysis: Weight Loss, Improvement of Medical Conditions, and Quality of Life. Points are added or subtracted according to changes in these domains. Points are deducted for complications or reoperations. The total number of points defines the 5 outcome groups (failure, fair, good, very good, and excellent). Weight loss is analyzed by percentage of total excess weight loss (EWL).²

Changes in medical conditions related to obesity are analyzed based on resolution or improvement of major and minor comorbidities. The major comorbid conditions taken into consideration by BAROS are hypertension, cardiovascular disease, dyslipidemia, type II diabetes, sleep apnea syndrome, and osteoarthritis. The minor comorbid conditions include lower extremity venous stasis disease, gastroesophageal reflux, and urinary stress incontinence. Medical disorders are considered “resolved” when controlled without medication and “improved” when controlled by reduced doses of medication. Changes in quality of life following LAGB are analyzed by utilizing the Moorehead-Ardelt Quality of Life Questionnaire II (M-A QoLQII).⁴ Six items are used in the questionnaire for measuring a patient’s subjective impression of QoL in the areas of¹: general self-esteem,² physical activity,³ social contacts,⁴ satisfaction concerning work,⁵ pleasure related to sexuality, and⁶ focus on eating behavior. Points are added or subtracted based on the patient’s responses. The results of this questionnaire are then incorporated into the BAROS to determine the final score.

The M-A QoLQII has been improved since its initial inception in several ways. A question about food perception has been added. Questions and graphic symbols were revised to minimize the influence of “socially desirable” or “culture-sensitive” responses. Additionally, all of the questions are equally weighted and a 10-point Likert scale is used for scoring. The M-A QoLQII correlates well with other widely used health and well-being indicators, and the validity and reliability of its ability to assess QoL measurement has been established.^{5–8}

The original M-A QoLQ incorporated into the BAROS has

been used in several international studies to evaluate the outcomes of LAGB, but to date few United States studies have been published using the newly revised system.^{9–18} This report is one of the first in this country to use the M-A QoLQII incorporated into the BAROS to evaluate a cohort of patients who have undergone LAGB.

METHODS

A retrospective review of the first 120 patients who underwent LAGB at our institution was performed. The cases were performed by a single surgeon (VS) between November 2001 and November 2002. All patients, including those who have since had their band removed, are included in this study. After obtaining approval from the Institutional Review Board and after appropriate permission to reproduce the M-A QoLQII was obtained, the questionnaire, along with a survey of current weight and comorbidity information, was mailed to each patient with a cover letter explaining the voluntary nature of the study (**Figures 1 and 2**). Nonrespondents were contacted by phone, and a second mailing was sent approximately 6 weeks later. All responses were tabulated in a database, and BAROS scores were assigned to each patient according to the scoring systems established by Oria and Moorehead^{2,8} (**Figures 3 and 4**).

RESULTS

Sixty-seven responses were received of the 120 questionnaires (56%) mailed out. Seventy-nine percent of respondents were female. Fifty-three responses were received after the first mailing, and the remaining 14 responses were received after the second mailing and a follow-up phone call. Mean age was 43.6 years (range, 21 to 68). Preoperatively, the patients had a mean weight and BMI of 142.5 kg (range, 92.3 to 214.1) and 49.8 kg/m² (range, 38.4 to 67.7), respectively. They had an average of 3.1 comorbidities (range, 0 to 8). After a mean follow-up of 27.4 months (range, 21.5 to 34.9), the patients achieved a mean weight and BMI of 105.9 kg (range, 61.8 to 168.2) and 37.1 kg/m² (range, 23.0 to 53.4), respectively. The average EWL for the group was 53.2% (range, -7.5 to 108.6). Thirteen patients (19.4%) required repeat operative interventions. Five of these were for band removal, 4 for revision for band slippage, and 4 for port revisions/replacements.

One patient (1.5%) experienced weight gain, 5 patients (7.5%) reported between 0% EWL and 24.9% EWL, 28 (41.8%) reported 25% EWL to 49.9% EWL, 17 (25.4%) reported 50% EWL to 74.9% EWL, and 16 patients (23.9%)

MOOREHEAD - ARDELT QUALITY OF LIFE QUESTIONNAIRE
SELF ESTEEM, AND ACTIVITY LEVELS

Please make a check in the box provided to show your answer.

1. Usually I Feel...

 

Very Badly About Myself Very Good About Myself

2. I Enjoy Physical Activities...

 

Not At All Very Much

3. I Have Satisfactory Social Contacts...

 

None Very Many

4. I Am Able to Work...

 

Not At All Very Much

5. The Pleasure I get Out Of Sex Is...

 

Not At All Very Much

6. The Way I Approach Food Is...

 

I Live to Eat I Eat to Live

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Figure 1. Moorehead-Ardelt Quality of Life Questionnaire II.

achieved greater than 75% EWL. Three (4.5%) of these patients reported that their medical conditions were aggravated since LAGB, 21 (31.3%) reported no change in their comorbidities, 19 (28.4%) reported that their comorbidities had improved, 17 (25.4%) reported that 1 major comorbidity had resolved and others had improved, and 7 patients (10.4%) reported that all major comorbidities had resolved and other minor ones had improved. Patients also reported positive self-esteem and activity level scores across all categories. The mean scores for how patients

feel about themselves was 0.3 (range, -0.5 to 0.5), enjoyment of physical activity was 0.2 (range, -0.5 to 0.5), satisfaction with social contacts was 0.3 (range, -0.3 to 0.5), ability to work was 0.3 (range, -0.5 to 0.5), pleasure from sex was 0.3 (range, -0.5 to 0.5), and their approach to food was 0.1 (range, -0.5 to 0.5).

To incorporate these results into the BAROS scoring system, patients were divided into those with and those without comorbidities. Of the 55 patients (82%) with co-

Name: _____

What is your current weight? _____

Do you currently have your band in place? Yes No

Please answer the following questions regarding the presence of each disease before and after your operation.

	Before surgery?		After surgery?			
High Blood Pressure	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Heart Disease	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
High Cholesterol	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Diabetes	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Sleep apnea	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Arthritis	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Heartburn	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Urinary Incontinence	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>
Venous Leg Ulcers	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Worse <input type="checkbox"/>	Same <input type="checkbox"/>	Better <input type="checkbox"/>	Resolved <input type="checkbox"/>

Figure 2. Weight and comorbidity questionnaire.

morbidities, 7 (13%) were classified as failures. Twelve patients (22%) had fair, 20 (36%) had good, 9 (16%) had very good, and 7 (13%) had excellent results.

Twelve patients with no comorbidities (18%) were scored using the modified scoring system² (Table 1). According to this system, 1 patient (8%) was classified as a failure, 1 (8%) had a fair outcome, 4 (33%) had good, 3 (25%) had very good, and 3 (25%) had an excellent outcome. Combining the scoring systems gave a final result of a 12% failure rate, 19% fair, 36% good, 18% very good, and 15% excellent results among all patients.

DISCUSSION

It is generally recognized that weight loss alone is not an adequate measure of the success of a bariatric procedure.^{2,14-19} Utilizing the BAROS scoring system, following bariatric procedures, provides a means of assessing a more global response to the intervention by considering not only the %EWL, but also changes in medical conditions and quality of life. The BAROS scoring system incorporating the Moorehead-Ardelt Quality of Life questionnaire has been used in several other studies; however, no reports exist of utilizing the newest version (M-A QoLQ II)

of the quality of life questionnaire. The aforementioned improvements in the questionnaire allow for pre- and postsurgical assessment as well as comparison between control groups. The new scoring scale makes the instrument more sensitive and improves response-differentiation.⁸ In the past, a host of different systems have been used for assessing quality of life after bariatric surgery. These include the Short Form 36 Health Survey (SF-36), Impact of Weight on Quality of Life-Lite Questionnaire (IWQOL-Lite), Gastrointestinal Quality of Life Index, and the BAROS with the M-A QoLQ (original version), among others.^{9,11,19-21} Several studies report an improvement in the quality of life using all of the indices except the SF-36, which has given inconsistent results.^{11,19,20} The incorporation of the M-A QoLQII into the BAROS has created a simple, time efficient method of measuring outcomes following LAGB. The questionnaire can be completed in less than 1 minute without the need for structured interviews, assistance, or coaching. Our current analysis was conducted retrospectively using mailings to patients who had their initial procedure a minimum of 22 months before receiving the mailings. This method of data collection suffers from generally less than ideal response rates (56% in our case). We plan to routinely incorporate the M-A

WEIGHT LOSS % OF EXCESS (points)	MEDICAL CONDITIONS (points)	QUALITY OF LIFE QUESTIONNAIRE
Weight Gain (-1)	Aggravated (-1)	1. Usually I Feel...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
0-24 (0)	Unchanged (0)	2. I Enjoy Physical Activities...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
25-49 (1)	Improved (1)	3. I Have Satisfactory Social Contacts...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
50-74 (2)	One major resolved Others improved (2)	4. I Am Able to Work...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
75-100 (3)	All major resolved Others improved (3)	5. The Pleasure I Get Out of Sex Is...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
		6. The Way I Approach Food Is...  -50 -40 -30 -20 -10 +10 +20 +30 +40 +50
		-3 to -2.1 -2 to -1.1 -1 0 1 1.1 to 2 2.1 to 3 Very Poor Poor Fair Good Very Good Quality of Life
Subtotal:	Subtotal:	Subtotal:
COMPLICATIONS Minor: Deduct 0.2 point Major: Deduct 1 point		REOPERATION Deduct 1 point
TOTAL SCORE <input type="text"/>		OUTCOME GROUPS SCORING KEY Failure 1 point or less Fair > 1 to 3 points Good > 3 to 5 points Very Good > 5 to 7 points Excellent > 7 to 9 points

Figure 3. Bariatric analysis and reporting outcome system (BAROS) with Moorehead-Ardelt Quality of Life Questionnaire II scoring key.

Failure	0 points or less
Fair	>0 to 1.5 points
Good	>1.5 to 3 points
Very good	>3 to 4.5 points
Excellent	>4.5 to 6 points

QoLQII questionnaire into our postoperative band-adjustment visits, hoping to produce a follow-up report with inclusion of a much higher percentage of patients and a longer follow-up period. Coupling these data with preoperative BAROS scores will further enhance this study.

The BAROS scores established in our series compare fa-

vorably to several other gastric banding studies. Favretti¹⁵ with one of the largest series of 170 patients with greater than 18-month follow-up reported a failure rate of 10%, fair outcome in 42%, good (corresponding to our good and very good category) outcome in 44%, and excellent outcome in 4% of his patients. Promising results were also published by Hell in a series of 30 patients with only a 3% failure rate and 23% of patients achieving excellent results.¹⁶ Other reports, such as those by Victorzon, Wolf, and Martikainen did not demonstrate any patients with “excellent” BAROS scores and had failure rates of 12% to 50%.^{13,17,18}

Some of the limitations to the BAROS scoring system manifest when comparing different bariatric procedures. For example, the BAROS scoring system does not account for perioperative or subsequent weight-loss related mortality (severe malnutrition or hepatic failure). As such,

patients undergoing procedures with the highest incidence of mortality (such as biliopancreatic diversion) that are also associated with the highest initial weight loss, as a group, are likely to score the highest, using the BAROS scoring system. A similar argument is likely to apply to patients undergoing Roux-en-Y gastric bypass (RYGB). In fact, excellent results after RYGB were noted in 63% of the patients in the study by Hell, with a 0% failure rate.¹⁶ Nguyen²¹ reported excellent results in 25% and very good results in 47% of the patients undergoing laparoscopic RYGB 6 months after the operation. In regards to biliopancreatic diversion (BPD), Marinari²² demonstrated 39.5% very good, and 23.2% excellent BAROS results in a 15-year follow-up study. Other reports demonstrate 63.3% and 41.9% very good results after BPD.^{23,24} Recognizing the impact of weight loss on the BAROS score and the absence of any measure of mortality using the BAROS scoring system, one has to be cautious comparing scores reported for studies involving entirely different bariatric procedures.

Length of follow-up is another factor not accounted for in the BAROS scoring system. Just as survival following therapy for cancer would be quite different depending on the length of follow-up, the outcome of any bariatric procedure should be strongly judged by the length of follow-up. Weight loss after LAGB is gradual and steady, often taking 2 years to 3 years to reach the 50%EWL to 60%EWL range.²⁵ Considering the major impact of weight loss alone in the scoring system, any short-term report (2 years or less) is likely to favor RYGB and BPD over LAGB with regards to BAROS scores.

Our reoperation rate among the responders was 19.4%, one third of which were due to port complications. This reoperation rate is more than double our 8.6% reoperation rate among our nearly 450 patients who have undergone LAGB to date. Undoubtedly, with longer periods of follow-up, the incidence of repeat operative procedures (including port-related procedures, revision, and removal of bands) can only increase. This phenomenon further points out the significance of length of follow-up when comparing different studies. Another explanation for this difference in incidence of reoperation rates may be the impact of our learning curve, as the patients in our current report represent the first to undergo this procedure at our institution.

CONCLUSION

Utilization of the new M-A QoLQII incorporated into the BAROS provides a simple, standardized method of assess-

ing the outcome of LAGB patients. The questionnaire can be given to patients preoperatively and on subsequent follow-up visits to assess progress over time. The different sections of the BAROS allow for differentiation between success and failure from weight loss, change in comorbidities, or quality of life. More widespread use of this tool will help provide better insight into the short- and long-term effects of weight-loss surgery.

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